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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,641	08/18/2003	Mark Munch	COOL-00901	4440

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EXAMINER
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JIANG, CHEN WEN

ART UNIT	PAPER NUMBER
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3744

DATE MAILED: 07/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/643,641

Applicant(s)

MUNCH ET AL.

Examiner

Chen-Wen Jiang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-135 is/are pending in the application.
- 4a) Of the above claim(s) 14-24, 36-46, 58-69 and 71-132 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 25-35, 47-57, 70 and 133-135 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 20060221, 20060315, 20060405, 20060531, 20060626
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Appeal conference has been conducted on 7/20/2006. Applicant's Appeal Brief, see pages 7-21, filed 5/2/2006, with respect to the rejection(s) of claim(s) 1-13 and 135 under 35 USC 112 have been fully considered and are persuasive. Therefore, the finality of that action has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the interpretations discussed by the Applicant. Applicant's arguments about the "[T]he fluid in the inlet and outlet port freezes later than the fluid elsewhere in the heat exchanger, and for freezing to advance towards the one or more compressible objects" and "the heat exchanger is configured so that fluid within the plurality of microchannels freezes before fluid within the outlet port and the inlet port" are obvious to one having ordinary skill in the art because Applicant discloses "The air pockets are positioned farthest away from a location where liquid begins to freeze in the chamber" to prevent cracking of a liquid system, "A critical factor is use of any material or structure that assists a particular location become cold fastest, and so that progression of freezing is continuous from that location to the air pockets 85 and 87 of Fig.4" of a housing with inlet and outlet chambers and related structures in the disclosure.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. Claims 25,26,28-35,47,48,50-57,70,133 and 134 are rejected under 35 U.S.C. 102(b) as being anticipated by Oberholzer et al. (U.S. Patent Number 6,119,729).

Oberholzer et al. disclose a freeze protection apparatus. Referring to Figs.1 and 1a, a freeze-protected conduit 10 comprises an elongated conduit 12 for conveying or containing liquid, and an elongated, compressible elastomeric material 14 disposed within the conduit 12. Examples of compressible elastomeric material 14 include foam, rubber, foamed neoprene and silicone sponge rubber. Preferably, the compressible elastomeric material 14 is fully sealed on all its sides and ends by a liquid impermeable membrane 18 to form an insert 20 which is disposed inside of conduit 12. It is noted that Oberholzer et al. disclose “preferably” to have membrane means the membrane is optional in the system. A choice for membrane material is a thin metal foil coated with a protective layer such as a plastic film. Another preferred choice is a thin, flexible, plastic membrane materials include polyester and fluoropolymers. Referring to Figs.6 and 7, heat exchanger 50 has supply header 68 (inlet chamber), discharge header 72 (outlet chamber) and collectors 56. Every fluid system in solar collector 50 may be adapted for use with the freeze protection apparatus of the apparatus. Referring to Fig.1, preferably insert 20 is disposed along the axis of conduit, particularly where conduit 12 is used in heat transfer application. Therefore, the fluid begins to freeze on the conduit and advance toward the insert 20. Under the principals of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will

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inherently perform the claimed process. Examiner disagrees with Applicant's arguments about Oberholzer's disclosure.

Response to arguments:

a) Applicant asserts Oberholzer discloses freeze-protected conduit with a compressible insert disposed along its entire length.

Figs.1 and 1a are segments of apparatus presented in Fig.6. Oberholzer discloses that every fluid system in the heat exchanger 50 may be adapted for use with the freeze protection apparatus. Therefore, these segments include headers 68,72, channels, conduits 64,76 and manifold 66,74.

b) Applicant asserts Oberholzer discloses a freeze protected conduit that is substantially radially symmetrical.

The conduit itself is substantially radially symmetrical.

c) Applicant asserts the structure cited is not an enclosure.

The apparatus of Fig.6 is an enclosure. Fig. 6 is the structure used in the rejection and it is the same type of heat exchanger disclosed and elected by the Applicant (Fig.10) for the limitation of enclosure. Applicant elected Fig.10 associated with claims which include enclosure in the apparatus which affirm the structure is an enclosure.

d) Applicant asserts Oberholzer does teach a structure that causes to begin to freeze at a location or set of locations.

Applicant is reminded that heat exchanger is to exchange heat between the fluid inside the channels and the medium outside the channels. Freeze happens when outside temperature is lower than inside and also equal or lower than the freezing point. Therefore, the freeze will begin

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at the fluid next to the walls with lowest temperature and these are the location or set of locations to begin to freeze.

e) Applicant asserts Oberholzer does not show a conduit configured for freezing to advance toward the compressible insert.

As discussed above, the freeze will begin at the fluid next to the walls with lowest temperature. Therefore, it advances toward the compressible insert. Applicant is reminded that the purpose of the insert is freeze protection. It will defeat the purpose if the insert is located at the place freezing occurs first. This is also taught by Mihara and will be discussed later.

f) Applicant asserts the disclosure of Oberholzer is non-enable for freeze protected conduit that includes an insert without a membrane.

Examiner respectfully disagrees Applicant remark because both Applicant and Oberholzer disclose the same type of materials. Applicant discloses the compressible objects can be made of sponge, foam, air-filled bubbles, balloons and encapsulated package. Oberholzer discloses the compressible elastomeric material includes silicone foam, foamed butyl rubber, foamed neoprene, silicone sponge, urethane foam and other elastomers.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 1-13 and 135 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oberholzer et al. (U.S. Patent Number 6,119,729) in view of Mihara (JP 10099592).

Oberholzer et al. disclose a freeze protection apparatus. Referring to Figs.6 and 7, heat exchanger 50 has supply manifold 66, return manifold 74 and collectors 56. The collector 56 comprises supply header 68, discharge header 72 and a plurality of channels 70. Referring to Figs.1 and 1a, a freeze-protected conduit 10 comprises an elongated conduit 12 for conveying or containing liquid, and an elongated, compressible elastomeric material 14 disposed within the conduit 12. Oberholzer et al. disclose that every fluid system in the heat exchanger 50 may be adapted for use with the freeze protection apparatus. Oberholzer et al. also disclose the freeze protection is equally applicable to a liquid containing conduit or other apparatus which is subject to freezing in heat transfer and non-heat transfer processes. However, Oberholzer et al. do not disclose compressible object coupled to the inlet and outlet ports which configured so that the fluid in the inlet port and the outlet port freezes later than the fluid elsewhere in the heat exchanger, and freezing to advance towards the one or more compressible objects. Mihara discloses the compressible material should locate at the latest freezing location in the same field of endeavor for the purpose of absorb pressure due to freeze in the liquid system [0009].

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the apparatus of Oberholzer et al. with compressible material should locate at the latest freezing location in view of Mihara so as to absorb pressure due to freeze.

In regard to claim 2, the compressible objects accommodate a predetermined level of fluid expansion.

In regard to claim 3, Mihara discloses the ratio of the hollow part 32 volume to the pump chamber volume is made about 10% or more.

In regard to claim 4, the compressible objects being capable of contracting and expanding between a minimum volume and a maximum volume.

In regard to claim 5, Fig.1a of Oberholzer et al. and Fig.4 of Mihara show the compressible object can be secured.

In regard to claim 6, the compressible objects are confined within the supply manifold, return manifold, supply header or return header.

In regard to claims 7-13, Oberholzer et al. disclose examples of compressible elastomeric material 14 include foam, rubber, foamed neoprene and silicone sponge rubber. Preferably, the compressible elastomeric material 14 is fully sealed on all its sides by a liquid impermeable membrane 18 to form an insert 20 which is disposed inside of conduit 12. A choice for membrane material is a thin metal foil coated with a protective layer. Another preferred choice is a thin, flexible, plastic membrane. Examples of plastic membrane materials include polyester, such as kaladex, and fluoropolymers, such as Teflon.



In regard to claim 135, Oberholzer et al. disclose the freeze protection is equally applicable to a liquid containing conduit or other apparatus which is subject to freezing in heat transfer and non-heat transfer processes.

6. Claims 27 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oberholzer et al. (U.S. Patent Number 6,119,729) in view of Mihara (JP 10099592 with machine English translation).

The reference discloses the compression calculation claimed except for the 5 to 25 percent of the amount of fluid expansion. Mihara disclose a method and apparatus to prevent a pump from being damaged due to the freezing of water by incorporating a freely compressible body in a chamber of the pump. The freely compressible hollow part 32 is incorporated into the pump chamber 1 absorbs the expansion in volume of ice to eliminate the pressure on the inner wall of the pump. The hollow part 32 is formed by foam which can be contracted freely. The ratio of the hollow part 32 volume to the pump chamber volume is made about 10% or more. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the apparatus of Oberholzer et al. with an expansion in view of Mihara so as to absorption of fluid expansion between 5-25%.

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chen-Wen Jiang whose telephone number is (571) 272-4809. The examiner can normally be reached on Monday-Thursday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Chen-Wen Jiang  
Primary Examiner



CHERYL TYLER  
SUPERVISORY PATENT EXAMINER